

CLAIMS

1. A refractory composition comprising a silica binder and a first set of components, the first set of components comprising alumina, zirconia, and silica, where the silica binder is in the range of about 5 wt % through about 20 wt % of the dry weight of the first set of components.
2. The refractory composition according to Claim 1, where the first set of components comprises about 50 to about 70 wt % alumina, about 10 to about 25 wt % zircon, and about 15 to about 35 wt % mullite.
3. The refractory composition according to Claim 1, where the first set of components comprises about 55 to about 60 wt % alumina, about 15 to about 20 wt % zircon, and about 21 to about 27 wt % mullite.
4. The refractory composition according to Claim 2, where the silica binder is an aqueous colloidal silica binder.
5. The refractory composition according to Claim 4, where the colloidal silica binder is in the range of about 8 wt % through about 12 wt % of the dry weight of the first set of components.
6. The refractory composition according to Claim 1, further comprising a setting agent.
7. The refractory composition according to Claim 6, where the setting agent is magnesia.
8. The refractory composition according to Claim 1, where the refractory composition is formed on at least one wear portion of a glass tank.
9. The refractory composition according to Claim 1, where the refractory composition comprises about 65 to about 80 wt % alumina, about 7 to about 15 wt % zirconia, and about 10 to about 20 wt % silica.

10. The refractory composition according to Claim 1, where the refractory composition comprises about 70 to about 75 wt % alumina, about 9 to about 13 wt % zirconia, and about 13 to about 17 wt % silica.

11. A refractory composition for a glass melting furnace comprising about 70 to about 75 wt % alumina, about 9 to about 13 wt % zirconia, and about 13 to about 17 wt % silica, where at least part of the silica is provided by a colloidal silica binder.

12. A method of preparing a refractory for a glass melting furnace, comprising:

providing a refractory composition comprising a silica binder and a first set of components, wherein the first set of components comprises alumina, zirconia, and silica; and

forming the refractory composition on the surface of a tank.

13. The method of claim 12 wherein the first set of components comprises about 50 to about 70 wt % alumina, about 10 to about 25 wt % zircon, and about 15 to about 35 wt % mullite.

14. The method of claim 13 wherein the silica binder is an aqueous colloidal silica binder in the range of about 5 wt % to about 20 wt % of the dry weight of the first set of components.

15. The method of claim 14 further comprising the step of mixing the first set of components with the aqueous silica binder.

16. The method of claim 13, wherein the refractory composition is formed by casting.

17. The method of claim 13, wherein the refractory composition is formed by pumping.

18. The method of claim 13, wherein the refractory composition is formed by shotcreting.

19. The method of claim 14 wherein the refractory composition further comprises a setting agent.